



Environmental Health

& Engineering, Inc.

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August 19, 2016

Julien Farland, M.S., RBP, CBSP  
Director of Biological Safety  
Community Initiatives Bureau  
Boston Public Health Commission  
1010 Massachusetts Avenue, 2nd Floor  
Boston, MA 02118

Dear Mr. Farland,

Per your request, we have reviewed the documents you provided to us that pertain to [REDACTED] proposed project at the Boston University (BU) National Emerging Infectious Diseases Laboratories (NEIDL). You requested that we provide a biosafety and biosecurity document review related to the work proposed for Biosafety Level Two (BL2) containment by [REDACTED]. This work involves the cloning of full-length cDNA's of Risk Group 4 (RG4) non-segmented negative-sense RNA virus genomes in non-pathogenic strains of *E. coli*.

The documents that we reviewed included:

- National Institutes of Health (NIH) Response Letter to Boston University, dated July 15, 2016, indicating authorization for [REDACTED] to lower containment to BL2 for work involving the full-length cloning of filoviruses Marburg and Ebola and the paramyxoviruses Nipah and Hendra in *E. coli* K12 strains (document file titled *BU\_NEIDL\_[REDACTED]\_Approval*)
- Boston University (BU) "Application to NIH OBA to Lower Containment for the Cloning of Full-length cDNAs of RG4 ssns<sup>(-)</sup> RNA Virus Genomes in Non-Pathogenic Strains of *E. Coli*" – Principal Investigator [REDACTED] (document file titled *Application to NIH OBA 03.03.2016 clean*)



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- Electronic mail response from [REDACTED] at BU to questions posed by [REDACTED], dated May 23, 2016

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- Electronic mail response from the Centers for Disease Control and Prevention (CDC) to [REDACTED] at BU, indicating that the proposed experimental work is not regulated under the Select Agent regulations, dated February 4, 2016.

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While we agree with the NIH that this work can be safely conducted at BL2, we offer the following findings and recommendations to enhance the safety and security aspects of the proposed project. We recommend that you and your Boston Public Health Commission (BPHC) colleagues review these and communicate as appropriate to the appropriate representatives at Boston University.

Finding	Recommendation
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To our knowledge, [REDACTED] is not approved by the BU IBC and the BPHC for work with Nipah and Hendra viruses. The NIH letter dated July 15, 2016, does indicate the approval to work at BL2 with the fulllength clones of these agents in E. coli K12 strains. As both Nipah and Hendra viruses require BL4 containment and are regulated as Overlap Select Agents, if BU's proposed safeguards fail and the experiments result in the generation of these viruses, BU would be in a position where there would be a need for immediate reporting to the CDC and BPHC. If at the time of discovery of the virus generation BU does not have a CDC Select Agent Registration, then this situation would require immediate notification to the CDC and could result in regulatory sanctions. If at the time of discovery of the virus generation BU does possess a CDC Select Agent Registration that does not currently list these viruses, then immediate notification to the CDC would be required followed by an amendment to the Select Agent Registration.

•BU should include in the training for those personnel working on the proposed BL2 project that currently Nipah and Hendra viruses are not approved for storage and use at the NEIDL, and that there are serious ramifications should the proposed safeguards fail or be ignored for the work to be conducted at BL2.

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Full length genomic RNA or cDNA for the RG4 filoviruses and henipaviruses are not considered Select Agents. However, a person with a proper knowledge can use this cDNA to rescue infectious virus. It was noted in the "Application to NIH OBA" that access to the FullLength cDNA Laboratory (FLCL) will be controlled by iris scan and access is controlled by the Director of NEIDL. A basic and criminal background check is performed.

•BU should consider upgrading the proposed background checks for FLCL personnel to include aspects required for Select Agent Personnel Suitability Assessments such as a thorough psychological assessment. •BU should develop, implement and communicate a policy to those authorized to work in the FLCL, addressing the consequences of failing to adhere to the required FLCL policies. •BU should establish a visitors' entry log book at the entry points of the FLCL to record entries of trainees and other approved visitors who do not have personal access.



It was noted in the "Application to NIH OBA" that all generated full length genome plasmids and corresponding bacterial glycerol stocks will be stored in secured freezers and are accounted for using an electronic inventory control system. An annual inventory check of full-length clones is noted.	•BU should include the results of the annual inventory in a report to BPHC.
The information contained in the "Application to NIH OBA" related to biosafety practices and biosecurity was limited.	•BU should provide the biosafety manual and/or SOPs for work in the FLCL facility to BPHC for review.

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Finding	Recommendation
Training requirements are briefly detailed in [REDACTED] "Application to NIH OBA".	•BU should provide BPHC with training completion files for all personnel working in the FLCL, including training content, for review.
Emergency planning is briefly detailed in [REDACTED] "Application to NIH OBA".	•BU should provide BPHC with more detailed protocols describing what to do in an event of emergency. BU should post emergency protocols in the FLCL laboratories so they are readily accessible.



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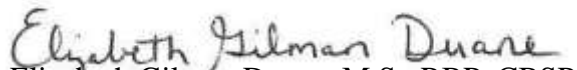
In their July 15, 2016 response letter, NIH has indicated that copies of annual reports and research protocols involving Risk Group 4 (RG4) cDNA are to be submitted to the BU Institutional Biosafety Committee (IBC) and to the NIH Office of Science Policy (OSP) upon request.

•BU should submit copies of annual reports and research protocols involving RG4 cDNA to the BU IBC, the NIH OSP upon request, and also to the BPHC.


We will be pleased to review the additional materials outlined above if BU provides them to the BPHC as recommended.

If you have any questions or would like to discuss these recommendations in more detail, don't hesitate to contact us at [BGDuane@eheinc.com](mailto:BGDuane@eheinc.com) and [NYun@eheinc.com](mailto:NYun@eheinc.com).

Regards,

  
Elizabeth Gilman Duane, M.S., RBP, CBSP

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